

# Biochemical Genetics—Volume 24

A journal for the reporting of original research in biochemical genetics of any organism, from virus to man. Papers will deal with the molecular aspects of genetic variation and evolution, mutation, gene action and regulation, immunogenetics, somatic cell genetics, and nucleic acid function in heredity and development and with the biochemical aspects of genetic defects (provided these are not purely clinical).

Papers on new methods that apply to the above topics will be included.

Review articles will also be published occasionally.

## EDITOR

Hugh S. Forrest, Department of Zoology, University of Texas at Austin, Austin, Texas

## EUROPEAN EDITOR

D. A. Hopkinson, The Galton Laboratory, London, England

## ASSOCIATE EDITORS

Charles R. Shaw, University of Texas M. D. Anderson Hospital, Houston, Texas

Richard E. Tashian, University of Michigan, Ann Arbor, Michigan

Allan C. Wilson, University of California, Berkeley, California

## EDITORIAL BOARD

- C. Baglioni, State University of New York, Albany, New York
- L. Beckman, University of Umeå, Umeå, Sweden
- G. J. Brewer, University of Michigan, Ann Arbor, Michigan
- D. J. Cove, University of Leeds, Leeds, England
- C. H. Doy, Australian National University, Canberra, Australia
- W. F. Feenstra, University of Groningen, Groningen, The Netherlands
- J. R. S. Fincham, University of Edinburgh, Edinburgh, Scotland
- W. M. Fitch, University of Southern California, Los Angeles, California
- H. H. Fudenberg, University of South Carolina, Charleston, South Carolina
- J. B. Harborne, University of Reading, Reading, England
- L. Hood, California Institute of Technology, Pasadena, California
- J. J. Hutton, Children's Hospital Research Foundation, Cincinnati, Ohio
- G. Johnson, Washington University, St. Louis, Missouri
- T. H. Jukes, University of California, Berkeley, California
- H. N. Kirkman, University of North Carolina, Chapel Hill, North Carolina
- L. I. Korochkin, Institute of Developmental Biology, Moscow, USSR
- R. Lewontin, Harvard University, Cambridge, Massachusetts
- E. Margoliash, Northwestern University, Evanston, Illinois
- K. Paigen, University of California, Berkeley, California
- F. H. Ruddle, Yale University, New Haven, Connecticut
- J. G. Scandalios, North Carolina State University, Raleigh, North Carolina
- D. C. Shreffler, Washington University, St. Louis, Missouri
- O. Smithies, University of Wisconsin, Madison, Wisconsin
- Z. Šormová, Institute of Organic Chemistry and Biochemistry, Prague, Czechoslovakia
- H. E. Sutton, University of Texas at Austin, Austin, Texas
- E. Vesell, Pennsylvania State University, Hershey, Pennsylvania
- R. P. Wagner, Santa Fe, New Mexico
- G. S. Whitt, University of Illinois, Urbana, Illinois
- James E. Womack, Texas A&M, College Station, Texas
- W. J. Young, University of Vermont, Burlington, Vermont

*Biochemical Genetics* is published bimonthly by Plenum Publishing Corporation, 233 Spring Street, New York, N.Y. 10013. Subscription orders should be addressed to the publisher. *Biochemical Genetics* is abstracted or indexed in Biological Abstracts, Chemical Abstracts, Chemical Titles, Current Awareness in Biological Sciences, Current Contents, Excerpta Medica, Index Medicus, Mental Health Abstracts, Referativnyi Zhurnal, and Science Citation Index. © 1986 Plenum Publishing Corporation. *Biochemical Genetics* participates in the Copyright Clearance Center (CCC) Transactional Reporting Service. The appearance of a code line at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use. However, this consent is given on the condition that the copier pay the flat fee of \$5.00 per copy per article (no additional per-page fees) directly to the Copyright Clearance Center, Inc., 27 Congress Street, Salem, Massachusetts 01970, for all copying not explicitly permitted by Sections 107 or 108 of the U.S. Copyright Law. The CCC is a nonprofit clearinghouse for the payment of photocopying fees by libraries and other users registered with the CCC. Therefore, this consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale, nor to the reprinting of figures, tables, and text excerpts. 0006-2928/86 \$5.00

## Subscription rates:

Volume 24, 1986 (12 issues) \$360.00 (outside the U.S., \$402.00).

Volume 25, 1987 (12 issues) \$395.00 (outside the U.S., \$441.00).

Second-class postage paid at New York, N.Y., and at additional mailing offices. Postmaster: Send address changes to *Biochemical Genetics*, Plenum Publishing Corporation, 233 Spring Street, New York, N.Y. 10013.

Printed in U.S.A.

*Biochemical Genetics* is published bimonthly by Plenum Publishing Corporation, 233 Spring Street, New York, N.Y. 10013. Subscription orders should be addressed to the publisher. *Biochemical Genetics* is abstracted or indexed in Biological Abstracts, Chemical Abstracts, Chemical Titles, Current Awareness in Biological Sciences, Current Contents, Excerpta Medica, Index Medicus, Mental Health Abstracts, Referativnyi Zhurnal, and Science Citation Index. © 1986 Plenum Publishing Corporation. *Biochemical Genetics* participates in the Copyright Clearance Center (CCC) Transactional Reporting Service. The appearance of a code line at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use. However, this consent is given on the condition that the copier pay the flat fee of \$5.00 per copy per article (no additional per-page fees) directly to the Copyright Clearance Center, Inc., 27 Congress Street, Salem, Massachusetts 01970, for all copying not explicitly permitted by Sections 107 or 108 of the U.S. Copyright Law. The CCC is a nonprofit clearinghouse for the payment of photocopying fees by libraries and other users registered with the CCC. Therefore, this consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale, nor to the reprinting of figures, tables, and text excerpts. 0006-2928/86 \$5.00



# BIOCHEMICAL GENETICS

Vol. 24, Nos. 1/2, February 1986

---

## CONTENTS

Genetic Variation of an Acid Phosphatase ( <i>Acp-2</i> ) in the Laboratory Rat: Possible Homology with Mouse AP-1 and Human ACP2 <i>K. Bender, S. Bissbort, A. Kuhn, M. Nagel, and E. Günther</i>	1
Genetical and Biochemical Comparisons of Alcohol Dehydrogenase Isozymes from <i>Anastrepha fraterculus</i> and <i>A. obliqua</i> (Diptera: Tephritidae): Evidence for Gene Duplication <i>Sergio Russo Mattioli, J. S. Morgante, and A. Malavasi</i>	13
The Biochemical Genetics of Permethrin Resistance in the Learn-PyR Strain of House Fly <i>J. G. Scott and G. P. Georgioui</i>	25
Elucidation of B-Genome Donor to <i>Triticum turgidum</i> by Unique- and Repeated-Sequence DNA Hybridizations <i>James P. Thompson and J. Nath</i>	39
The Effect of Dietary Ethanol on the Composition of Lipids of <i>Drosophila melanogaster</i> Larvae <i>Billy W. Geer, Stephen W. McKechnie, and Marilyn L. Langevin</i>	51
Characteristics of Site Variation Among Clones of the 340-Base Pair, Tandemly Repeated <i>Eco</i> R1 Family of Human DNA <i>N. Burr Furlong, Koenraad Marien, Ben Flook, and Jim White</i>	71
Satellite DNA-Related Nucleosomal Proteins in <i>Drosophila virilis</i> <i>Gregory A. Viglianti and Martin Blumenfeld</i>	79
Detection of a Serum Class I Molecule in Rat with Anti-Rat Liver Beta-2-Microglobulin <i>Kozo Matsumoto, Takashi Natori, Takashi Agui, Shinya Tsutimoto, Akira Matsuhashi, and David L. Gasser</i>	93
Variant-Specific Differences in Human Unsaturated Transcobalamin II <i>H. J. Porck, R. R. Frants, J. Lindemans, G. J. M. Hooghwinkel, and R. J. Planta</i>	103
Specific Activity of $\alpha$ -L-Fucosidase in Sera with Phenotypes of Either Low, Intermediate, or High Total Enzyme Activity and in a Fucosidosis Serum <i>Richard A. DiCioccio, Joseph J. Barlow, and Khushi L. Matta</i>	115
Characterization of Three Electrophoretic Variants of Human Erythrocyte Triosephosphate Isomerase Found in Japanese <i>Jun-ichi Asakawa and Chiyoko Satoh</i>	131
†Differences Between the Levels of $\alpha$ - $\gamma$ Chain in the Fetal Hemoglobin in Two Types of Hereditary Persistence of Fetal Hemoglobin Are Linked with a Variation in the DNA Sequence <i>I. Bakioglu, A. Kutlar, and T. H. J. Huisman</i>	149

## †NOTE

---

# BIOCHEMICAL GENETICS

Vol. 24, Nos. 3/4, April 1986

---

## CONTENTS

Genetic Variation for Superoxide Dismutase Level in <i>Drosophila melanogaster</i> <i>Jean-Daniel Graf and Francisco J. Ayala</i>	153
Evidence for a Possible Regulatory Gene ( <i>Suc-1</i> ) Controlling Sucrase Expression in Mouse Intestine <i>P.S. James, M.W. Smith, G.W. Butcher, D. Brown, and E.K. Lund</i>	169
Fourteen Genetically Variant Proteins of Mouse Brain: Discovery of Two New Variants and Chromosomal Mapping of Four Loci <i>David Goldman and Harold J. Pikus</i>	183
Biochemical and Genetic Characterization of L-Glutamate Transport and Utilization in <i>Salmonella typhimurium</i> LT-2 Mutants <i>Jaime Alvarez-Jacobs, Mireya de la Garza, and Manuel V. Ortega</i>	195
Genetic Studies on the Muscle Protein Turnover Rate of Coturnix Quail <i>Y. Maeda, K. Hayashi, T. Hashiguchi, and S. Okamoto</i>	207
Biochemical Markers in Rats: Linkage Relationships of Aconitase ( <i>Acon-1</i> ), Aldehyde Dehydrogenases ( <i>Ahd-2</i> and <i>Ahd-c</i> ), Alkaline Phosphatase ( <i>Akp-1</i> ), and Hydroxyacid Oxidase ( <i>Hao-1</i> ) <i>Donald V. Cramer, Patricia A. Mowery, and Mark Adams</i>	217
Identity of Esterase-22 and Egasyn, the Protein Which Complexes with Microsomal $\beta$ -Glucuronidase <i>Sukumar Medda, Otto von Deimling, and Richard T. Swank</i>	229
Relationship Between $\alpha$ -Glycerophosphate Dehydrogenase Activity and Metabolic Rate During Flight in <i>Drosophila melanogaster</i> <i>Elyse M. Connors and James W. Curtsinger</i>	245
Independent Expression of the Two Mouse Adult $\beta$ -Globin Genes <i>C.J. Wawrzyniak and R.A. Popp</i>	259
A Sensitive Immunoblotting Technique to Identify Thyroxin-Binding Globulin Protein Heterogeneity After Isoelectric Focusing <i>Mohammad I. Kamboh and Robert E. Ferrell</i>	273
Inheritance of Isozyme Phenotype at Three Loci in the Freshwater Snail, <i>Goniobasis proxima</i> : Mother-Offspring Analysis and an Artificial Introduction <i>Robert T. Dillon, Jr.</i>	281
Analysis of Aldox <sup>n</sup> Alleles Isolated from Natural Populations of <i>Drosophila melanogaster</i> <i>Michael M. Bentley</i>	291
Enzymatic Control of Anthocyanin Expression in the Flowers of Pea ( <i>Pisum sativum</i> ) Mutants <i>Geza Hrazdina and Norman F. Weeden</i>	309
X-Linked Mutations That Give Rise to Overproduction of Glucose-6-Phosphate Dehydrogenase in <i>Drosophila melanogaster</i> <i>M. Iwabuchi, S.H. Hori, and N. Yorimoto</i>	319

---



# BIOCHEMICAL GENETICS

Vol. 24, Nos. 5/6, June 1986

---

## CONTENTS

Restriction Endonuclease Mapping of Ribosomal RNA Genes: Sequence Divergence and the Origin of the Tetraploid Treefrog <i>Hyla versicolor</i> <i>P. R. Romano and J. C. Vaughn</i>	329
Variation in the Substrate Specificity of Allozymes Catalyzing Flavone-O-Glucoside Biosynthesis in <i>Silene</i> Plants <i>Jan M. Steyns and Jan v. Brederode</i>	349
Genetic Control of Acid Phosphatase $R_m$ and Its Relation to Control of Peroxidase $R_m$ in Flax ( <i>Linum</i> ) Genotrophs <i>H. Tyson, M. A. Fieldes, and J. Starobin</i>	369
Pig Mitochondrial DNA: Polymorphism, Restriction Map Orientation, and Sequence Data <i>Tomomasa Watanabe, Yukimasa Hayashi, Jun Kimura, Yukio Yasuda, Naruya Saitou, Takeshi Tomita, and Nobuaki Ogasawara</i>	385
Effects of Various Metabolites on Two Phosphoglucumutase Allozyme Activities from <i>Drosophila melanogaster</i> <i>Giovanni Pontecorvo, Mario Carfagna, Laura Fucci, and Luciano Gaudio</i>	397
Purine Nucleoside Phosphorylase Polymorphism in the Genus <i>Littorina</i> (Prosobranchia: Mollusca) <i>Andrew J. Knight and Robert D. Ward</i>	405
Restriction Endonuclease Map Variation in the <i>Adh</i> Region in Populations of <i>Drosophila melanogaster</i> <i>S. R. H. Cross and A. J. Birley</i>	415
Genetic Control of the Mitochondrial Form of Superoxide Dismutase in Hexaploid Wheat <i>Paula R. Neuman and Gary E. Hart</i>	435
Developmental Variation in Effects of the Second and Third Chromosomes on the Activities of the Glucose 6-Phosphate and 6-Phosphogluconate Dehydrogenases in <i>Drosophila melanogaster</i> <i>Naohiko Miyashita and Cathy C. Laurie-Ahlberg</i>	447
Variation in Alpha-L-Fucosidase Properties Among 28 Inbred Mouse Strains: Six Strains Have High Enzyme Activity and Heat-Stable Enzyme with a Variant pH-Activity Curve; Twenty-Two Strains Have Low Activity and Heat-Labile Enzyme <i>William G. Johnson and Jacqueline L. Hong</i>	469
Amino Acid Sequence of the Active Site of Human Serum Cholinesterase from Usual, Atypical, and Atypical-Silent Genotypes <i>Oksana Lockridge and Bert N. La Du</i>	485
Distribution and Probable Physiological Role of Esterases in Reproductive, Digestive, and Fat-Body Tissues of the Adult Cotton Boll Weevil, <i>Anthonomus grandis</i> Boh. <i>Bobby R. Jones and Harold R. Bancroft</i>	499

---

# BIOCHEMICAL GENETICS

Vol. 24, Nos. 7/8, August 1986

---

## CONTENTS

Molybdenum Hydroxylases in <i>Drosophila</i> . III. Further Characterization of the <i>low xanthine dehydrogenase</i> Gene <i>David R. Schott, Madeline C. Baldwin, and Victoria Finnerty</i>	509
The Equine Protease Inhibitory System (Pi): Abnormal Expressions of $Pi^F$ , $Pi^L$ , and $Pi^{S1}$ <i>Scott D. Patterson and Kevin Bell</i>	529
Pigment Patterns in Mutants Affecting the Biosynthesis of Pteridines and Xanthommatin in <i>Drosophila melanogaster</i> <i>Juan Ferré, Francisco J. Silva, M. Dolores Real, and José L. Ménsua</i>	545
The Sensitivity of Isoelectric Focusing and Electrophoresis in the Detection of Sequence Differences in Proteins <i>Tracy McLellan and Lisa S. Inouye</i>	571
DNA Restriction-Fragment Variation in the Gene Family Encoding High Molecular Weight (HMW) Glutenin Subunits of Wheat <i>N. P. Harberd, D. Bartels, and R. D. Thompson</i>	579
Genetic Variation in Natural and Laboratory Populations of the Marsupial <i>Sminthopsis crassicaudata</i> <i>R. M. Hope, J. H. Bennett, and C. M. Chesson</i>	597
Gene-Dependent Flavonoid 3'-Hydroxylation in Maize <i>R. Larson, J. B. Bussard, and E. H. Coe, Jr.</i>	615
Detection of Lactate Dehydrogenase B <sub>4</sub> in Human Hemolysate of Patients Deficient in Lactate Dehydrogenase B Subunit Activity Using Enzyme Immunoassay <i>Kayoko Sudo, Masato Maekawa, and Takashi Kanno</i>	625
Intestinal Metallothionein in Lethal-Milk Mice with Systemic Zinc Deficiency <i>Arthur Grider, Jr., and Lawrence C. Erway</i>	635

---

# BIOCHEMICAL GENETICS

Vol. 24, Nos. 9/10, October 1986

---

## CONTENTS

Characterization of Alcohol Dehydrogenase in Young Soybean Seedlings <i>Ryszard Brzezinski, Brian G. Talbot, Douglas Brown, Danuta Klimuszko, Stephen D. Blakeley, and Jean-Paul Thirion</i>	643
Differences in the Metabolism of the Aromatic Amino Acid Hydroxylase Cofactor, Tetrahydrobiopterin, in Mutant Mice with Neurological and Immunological Defects <i>David S. Duch, Seaton W. Bowers, Jeffrey H. Woolf, Muriel T. Davisson, Lois J. Maltais, and Charles A. Nichol</i>	657
DNA Polymorphisms in North Sardinian Newborns and Their Linkage with Abnormal $\gamma$ Globin Gene Arrangements and with $\beta^0$ -Thalassemia <i>Y. Hattori, F. Kutlar, S. S. Chen, T. H. J. Huisman, P. Demuro, M. Formato, L. Manca, and B. Masala</i>	669
Genetic and Developmental Characterization of the <i>aldox-2</i> Locus of <i>Drosophila melanogaster</i> <i>Roy G. Meidinger and Michael M. Bentley</i>	683
Electrophoretic Polymorphism and Sexual Dimorphism in the Freshwater and Anadromous Threespine Sticklebacks ( <i>Gasterosteus aculeatus</i> ) of the Little Campbell River, British Columbia <i>R. E. Withler, J. D. McPhail, and R. H. Devlin</i>	701
†Trehalase Polymorphism in <i>Drosophila melanogaster</i> <i>Ronald S. Burton and Albert La Spada</i>	715
Linkage of <i>Pep-2</i> and <i>Apk</i> on Mouse Chromosome 10 <i>James E. Womack, Shawn Ashley, Lois B. Barnett, and Susan E. Lewis</i>	721
Evaluation of Interclonal Elemental-Profile Variation in Sitka Spruce Seed <i>Y. A. El-Kassaby, J. A. McLean, and A. M. K. Fashler</i>	729
Production of an Antibody to Mouse Salivary Androgen Binding Protein (ABP) and Its Use in Identifying a Prostate Protein Produced by a Gene Distinct from <i>Abp</i> <i>Stephen R. Dlouhy, William C. Nichols, and Robert C. Karn</i>	743
Induction of Alcohol Dehydrogenase Null Mutants in the Mediterranean Fruit Fly <i>Ceratitis capitata</i> <i>M. E. Riva and A. S. Robinson</i>	765
Peptidases in <i>Drosophila melanogaster</i> . I. Characterization of Dipeptidase and Leucine Amino-peptidase Activities <i>N. A. Hall</i>	775

†NOTE

---



# BIOCHEMICAL GENETICS

Vol. 24, Nos. 11/12, December 1986

## CONTENTS

DNA Sequence Evidence for Polymorphic Forms of Human Serum Amyloid A (SAA) <i>Barbara Kluge-Beckerman, George L. Long, and Merrill D. Benson</i>	795
Differences in the Androgen Response Between Two Mouse Species <i>Paul W. Houben, Leslie P. Bullock, and Thomas O. Fox</i>	805
A Gene Modifying Mitochondrial Malate Dehydrogenase Isozymes in <i>Sorghum</i> (Gramineae) <i>John Doebley, Clifford W. Morden, and Keith F. Schertz</i>	813
Albumin Evolution in Polyploid Species of the Genus <i>Xenopus</i> <i>Jean-Daniel Graf and Michail Fischberg</i>	821
Comparison of Growth, Exogenous Auxin Sensitivity, and Endogenous Indole-3-Acetic Acid Content in Roots of <i>Hordeum vulgare</i> L. and an Agravitropic Mutant <i>Laura Tagliani, Scott Nissen, and T. K. Blake</i>	839
Genetic Studies of Low-Abundance Human Plasma Proteins. I. Microheterogeneity of Zinc- $\alpha$ 2-Glycoprotein in Biological Fluids <i>Mohammad I. Kamboh and Robert E. Ferrell</i>	849
sn-Glycerol-3-Phosphate Oxidase and Alcohol Tolerance in <i>Drosophila melanogaster</i> Larvae <i>Stephen W. McKechnie and Billy W. Geer</i>	859
The Effect of Temperature on Biochemical and Molecular Properties of <i>Drosophila</i> Alcohol Dehydrogenase <i>Kevin C. McElfresh and John F. McDonald</i>	873
Variation in Ten Lysosomal Hydrolase Enzyme Activities in Inbred Mouse Strains <i>William G. Johnson, Jacqueline L. Hong, and Susan M. Knights</i>	891
Analysis of a Large Nontranscribed Spacer in the Ribosomal DNA of the House Cricket, <i>Acheta domesticus</i> (Orthoptera: Gryllidae) <i>Z. Dave Sharp, Anna Meriwether, Jerry Ware, and M. Donald Cave</i>	911
Composition and Genetic Variability of Heparin-Sepharose CL-6B Protein Fractions Obtained from the Solubilized Proteins of Mouse Organs <i>Peter Jungblut and Joachim Klose</i>	925
Segregation and Linkage Studies of Allozyme Loci in Pair Crosses of the Oyster <i>Crassostrea virginica</i> <i>David W. Foltz</i>	941
The Partial Characterization of Alcohol Dehydrogenase Null Alleles from Natural Populations of <i>Drosophila melanogaster</i> <i>A. L. Freeth, J. B. Gibson, and H. G. de Couet</i>	957
REFEREES FOR VOLUME 24	973
AUTHOR INDEX TO VOLUME 24	975
SUBJECT INDEX TO VOLUME 24	979